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ABSTRACT

Student anxiety in learning through distance education was measured using a modified version of the Docking's Affect Adjective Checklist and a student opinionnaire on factors affecting distance learning. The instruments were completed by 222 University of Southern Queensland (Australia) students enrolled in distance education. The instruments were administered both before and after the semester. The responses were subjected to statistical analysis by the t-test and analysis of variance techniques. The students exhibited a high anxiety level (a sample mean of 19 out of a possible 23) and were generally more anxious about their studies after the semester than before it (a sample mean of 21 out of a possible 23). On the other hand, students' negative feelings toward the top three factors affecting distance learning (content of study materials, finance, and readiness) decreased significantly at the end of the semester. Gender, age, marital status, and course of study were not significantly related to students' anxiety about distance education. However, a significant increase was noticed for the factor of time between the students' pre-semester and post-semester opinions, while some increase was noted for the factors of employment, family support, and "other" (health-related). It may be that while the students found ways to cope with the factors associated with content, environment, and readiness, the factors of time, employment, and family support were likely associated with more problems than the students had expected. (Contains 16 references.) (MN)

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Students' Anxiety in Learning Through Distance Education

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Abstract

Learning within the distance education context may be a daunting prospect for many students for a number of reasons. One likely source of concern is the intervening variable of anxiety, which has been found to have a serious inhibitory effect in conventional classrooms. The literature is replete with results of studies in traditional classrooms, but a review of the literature on distance learning indicates a dearth of studies on anxiety effects. This study therefore attempted to find out if distance education learners experience this state of dread and foreboding and also their opinions about factors which affect their learning through the distance education mode.

Using the Docking's Affect Adjective Checklist modified for use within a distance learning environment and, a Students' Opinionnaire on Factors Which Affect Learning at a Distance, a sample of 222 University of Southern Queensland students studying through the distance education mode were tested at the beginning and at the end of a semester. Using the statistics of t-test and Analysis of Variance (ANOVA), the results indicated that the students had a very high level of anxiety and were on the whole more anxious about their studies at the end of the semester than at the beginning. In addition, factors like content of the study materials, finance, time, readiness and employment, in the opinions of the students, significantly affected their studying at a distance.

As we look with enthusiasm into the future of distance education worldwide, there is a need to consider the effects that debilitating variables such as anxiety could exert on students' learning. The paper discusses the implications of the results and suggests areas for further studies.

Introduction

Learning within the distance education context may be a daunting prospect for many students. One likely source of concern is the intervening variable of anxiety, which has been found to have a serious inhibitory effect in conventional classrooms. There is evidence in the literature indicating that negative correlations exist between anxiety and students' achievement, as well as between anxiety and the realisation of important cognitive and affective outcomes within conventional face-to-face education (Spielberger, 1966; Tobias, 1979; Fraser, Nash & Fisher, 1983; Okebukola & Jegede, 1989; Jegede, Alaiyemola & Okebukola, 1990).

The obvious differences between face-to-face and distance learning and the attendant environmental variables which exert effect on distance learners make it highly possible that the effect of anxiety on learning at a distance could be more pronounced. Anxiety, which is the 'experience of dread and foreboding based on some specific expectation of harm rather than an obvious external threat' (Sieber, O'Neil & Tobias, 1977) needs to be eliminated or at least reduced to the barest minimum within the distance learning mode if learning is to be meaningful. One logical way of doing this is to begin to investigate the presence and level of anxiety of distance learners towards their instructional materials, and the factors contributing to this anxiety.

Although the literature is replete with results of studies in anxiety in traditional classrooms (see Tobias, 1979; Fraser, Nash & Fisher, 1983; Spielberger, 1966), a review of the literature on distance learning indicates a dearth of studies on anxiety and its effect on learning at a distance. Studies remotely related to anxiety have been reported on stress (Kosbad, 1989) and adult study problems (Brookfield, 1979; Knights & McDonald, 1982). These studies and others on the same issues were carried out primarily on adult learners returning to formal higher education after a long period of time. Very few studies have been reported within distance learning environment. For example James (1982) using the University College London Study Difficulty Questionnaire (UCLSQ) compared the well-being of on-campus and distance students. The absence of reported studies in the crucial area of anxiety and distance learning calls for the need to begin to fill the vacuum, especially in areas of anxiety level and factors which distance education students perceive to affect their studying at a distance. Isolation of specific variables which might have significant relationships with distance learners' perception of factors that affect their anxiety also warrant research.

The decision to study through the distance education mode is often a serious matter, especially if the student is a mature age working person with family and other commitments. Such a student would likely be faced with concerns which are biological, personal, emotional, and or environmental.

For mature age students the feeling of being at a disadvantage by virtue of their age, coupled with the long break from formal studies could be a source of stress. Feelings of whether they would cope with the demands of higher education, the effect of age on their study habits, memory, stamina and fatigue to mention but a few could be sources of anxiety.

Another important source of anxiety for most mature students learning at a distance is the responsibilities of the commitment to a partner and the raising of a family. Coping with family demands, child care and other related issues exert pressure on the time available for studies which must often also be fitted around full-time employment. Unsuitability of the home environment for study and severe financial constraints may add to the students' level of anxiety. Sharing the limited time and finance at a student's disposal to meet family, employment and study commitments could potentially be very stressful.

Apart from the problems a distance learner faces with finding time and space to work quietly, the distance from resource centres like libraries and study centres, the feeling of isolation, or the inability to attend residential school could pose serious disadvantages. All these together with other emotional problems faced by a distance learner are potential sources of anxiety which could persist throughout the study time. According to Fraser & Fisher (1982), previous research in anxiety in traditional classrooms has tended to concentrate almost exclusively on cognitive achievement criteria and has neglected equally important affective issues. For distance education, it does appear that affective issues dictate and sustain the need to study (Knights & McDonald, 1982) and should therefore be a priority focus of investigation.

In addition to investigating the affective issues, it is necessary to examine related issues of the sorts of moderator variables that affect anxiety and studying at a distance. Knights & McDonald (1982) opined that because care of children is usually a responsibility assumed by the mother, in addition to other family and household duties, female students tend to have more problems with studies. Indeed, Jegede, Alaiyemola & Okebukola (1990) in their study of anxiety in conventional education mode have stressed the need to look more closely at what environmental and personal variables contribute to raising the levels of anxiety, particularly in females. While the study by Kosbad (1989) and Usera (1985) are inconclusive about the effect of the variable of age on mature students' studies, Simon & Thomas (1983) concluded from their studies that the course pursued is associated with anxiety level. It would therefore be illuminating to address the effect of moderator variables like age, gender, marital status, and course of study on learning through the distance education mode.

The purpose of this study therefore was to investigate students' anxiety towards, and perception of factors engendering anxiety in learning through distance education.
Specifically, the study sought answers to the following:

- To what extent, if any, do distance learners exhibit anxiety towards instructional materials?

- What factors do distance learners perceive as engendering anxiety towards instructional materials?
- Do moderator variables like gender, age, course of study, and marital status have any significant relationships with distance learners' perception of factors that affect their anxiety?

Method

Sample

A total of 222 University of Southern Queensland distance education students formed the final sample of the study. The target population of the study consisted of all the distance education students enrolled with the University of Southern Queensland. Ten percent of the population were sampled using the systematic random sampling method. As a result, 730 students were served with the first administration of the instruments. The 370 who responded by sending completed instruments were then served with the second round of the administration of the instruments at the end of the semester. The aim was to obtain completed instruments from each student in the sample for both the first and second administrations. At the time of analysis 222 students completed both the pre-semester and post-semester administration of the instruments.

Instrumentation

Two instruments were developed and used to collect data for this study. They are the Affect Adjective Checklist on Distance Learning and the Student Opinionnaire on Factors which Affect Learning at a Distance.

Anxiety was measured by the Affect Adjective Checklist on Distance Learning which was a modification of Docking's (1978) checklist. The University College London Study Difficulty Questionnaire (UCLSQ) situated primarily within the fields of psychiatry, psychology, and psychotherapy which James (1982) used was not suitable for this study because of two major reasons. First, it is based on the 'well-being theory' of Crown, Lucas & Supramanium (1973) and does not measure anxiety level, and second, it is an instrument in which only one of the eight subscales asked a few questions on anxiety. This necessitated our designing an instrument which could appropriately measure anxiety level within the distance learning environment.

The instrument consisted of 23 key words embedded in a total of 66 adjectives which describe the feelings students might have towards distance education. Students were requested to underline as many or as few words which describe how they feel about learning at a distance. The 11 words designated (+) are scored 1 if they are underlined and 0 if they are not

underlined. The 12 words designated (-) are scored 0 if they are underlined and 1 if they are not underlined. The remaining 43 words are ignored in the scoring procedure. Each subject's total anxiety score is obtained by summing the scores for the key 23 words. The details of the instrument are contained in Fraser, Nash, and Fisher (1983). The instrument (see Appendix A) has been found to have a good concurrent validity (with correlations of 0.62 to 0.74 with other measures of anxiety). The K-R 20 reliability coefficient, and the test-retest reliability coefficient of the instrument were calculated to be 0.86 and 0.89 respectively for the sample used in this study.

Students' perception of what affect their learning at a distance was determined by the Student Opinionnaire on Factors which Affect Learning at a Distance. The construction of the instrument followed a number of procedures. First, a discussion was held with five members of staff of the Distance Education Centre who are themselves studying by the distance mode to identify major areas which affect distance learning. This discussion resulted in the identification of 10 broad areas. Next, the investigators generated a number of items under each of the 10 areas and submitted then to a panel of judges to validate. The panel which consisted of experts in the different areas of distance education, communications, data analysis, and educational psychology was asked to check if: the whole instrument is appropriate in measuring, to some extent, the construct of anxiety; the items are relevant for the subscales and for the whole instrument; the opinionnaire is suitable for use within the distance learning situation; and if the language and expressions are appropriate and understandable.

In checking the items the validators were also requested wish to:

* advise on items to be rejected, reconstructed or included in the opinionnaire without modification. Putting a mark and comment at the side of the affected items will do;

* provide alternative statements to any of the items you find improperly constructed;

* edit the language or the construction of any items you might judge inappropriate;

* suggest the rearrangement of any item within a subscale or a relocation to another subscale; and

* suggest the inclusion of new items or subscales.

Based on the responses from the validators a total of 40 items were judged as acceptable for inclusion in the final Opinionnaire.

The final copy of the Opinionnaire was in two sections. Section A sought biographical information of the respondents, while Section B containing 40 items eliciting the opinion of

the students was designed on a six-point Likert scale of 'Strongly Agree' 'Agree', 'Neutral', 'Strongly Disagree', 'Disagree' and 'Not Applicable' (scored 6, 5, 4, 3, 2, 1, 0 respectively for positive items; reverse scoring for negative items). The respondents were requested to place a tick in a box which best represented their opinion on each of the items in the Opinionnaire.

Factor analysis was carried out on the first response of the students to determine if the factors extracted reflected the ones identified in the discussion held with the staff during the initial period of constructing the instrument. The principal-axis factoring procedure with a varimax-rotated solution produced 8 factors with Eigenvalue greater than 1. The eight factors formed the subscales of Content, Environment, Finance, Readiness, Time, Employment, Family Support, and Others in the instrument. Examples of the subscales and items are as follows:

Content

The words in the study materials are easy to understand.

My limited background in this subject area will affect my understanding of the content.

Environmental

I am often distracted by noise when I try to study.

The lack of facilities, eg library, in my area will disadvantage me.

Family Support

My partner encouraged me to enrol in this course.

It concerns me that my partner had to undertake a larger share of home and family duties.

Other

My health problems make it difficult to study.

I have special needs which will influence my ability to successfully complete this course.

The Cronbach alpha reliability coefficient for the Student Opinionnaire on Factors which Affect Learning at a Distance was found to be 0.89 for the study sample.

Procedure and Administration

A pre-semester and post-semester instruments administration procedure was adopted in order to find out if the differences in the students' level of anxiety and opinions about factors which affect their studying at a distance were mainly due to the studies undertaken during the semester.

Both instruments were administered by mail just before the beginning and at the end of Semester One of 1992. Each administration was accompanied by a letter introducing the study and soliciting their cooperation in completing the instruments enclosed. Only those students who returned completed instruments of the first administration were sent another set at the end of the semester. The receipt of the completed instruments administered during the second administration was closed six weeks after the end of the semester to enable preparation for data processing.

Data Analysis and Findings

The data was analysed using the SPSS for Windows statistical software package. The means and standard deviations of the pre- and post-semester scores of the Affect Adjective Checklist on Anxiety and the Opinionnaire on Factors Which Affect Learning at a Distance are reported in Tables I and II.

TABLE I & II ABOUT HERE

T-tests carried out to compare the mean scores of the pre-semester and post-semester administrations of the two instruments attained significance for the anxiety checklist ([t (220) = -2.52, $p < .05$] and the Opinionnaire [t(189) = 2.19, $p < .05$].

The means and standard deviations for the pre- and post-semester responses to the Opinionnaire on factors affecting learning at a distance are as shown in Table III. A comparison of the means of the two administrations for each subscale using the T-test statistic is summarised in the same table. The data in Table III indicate that the differences in the pre- and post semester responses of the students for the factors of Content, Finance, Readiness, Time, and Employment attained significance ($p < .01$, $p < .05$). The data also reveal that except for the factors of Time and Employment, all the other factors which attained significance had an increase in mean scores at the post semester administration.

TABLE III & IV ABOUT HERE

Table IV contains the data on the ANOVA comparing the mean scores of student's post-semester responses to the Anxiety Checklist by the independent variables using the pre semester responses as covariates. Table V contains similar data for the Opinionnaire. It can be seen from Table IV that none of the variables indicated any significant relationship with anxiety. However, all the variables except gender indicated significant relationship with the responses on the Opinionnaire.

Discussion of Results

The study set out to investigate the extent, if any, to which distance learners exhibit anxiety towards instructional materials; what factors distance learners perceive as engendering anxiety towards instructional materials; and if moderator variables like gender, age, course of study,

and marital status have any significant relationships with distance learners perception of factors that affect their studying at a distance. The results obtained showed that the students in this study have a high anxiety level and were generally more anxious about their studies at the end of the semester than at the beginning (Table I). Furthermore their opinions about factors which affect learning at a distance were less positive at the end of the semester than at the beginning also. The results obtained seem to suggest that the factors of Content of the study materials, Finance and Readiness were the three top factors which affected their learning at a distance. Students' opinions at the beginning and at the end of the semester about the effects of the factors of Content of the study materials, Finance, Readiness, Time, and Employment differed significantly (Table III).

The variables of gender, age, marital status and course of study are not significantly related to students anxiety about studying at a distance (Table IV). But the variables of age, marital status and course are significantly related to students opinions about studying at a distance (Table V).

Although we are mindful of the limitations associated with studies of this type, eg., being a one-sample design and the possibility of confounding variables affecting the external validity, the extensiveness of the results warrants their thorough examination. The results indicated that the students exhibited some level of anxiety. Indeed the data as reported in Table I showed that the anxiety level was quite high (a sample mean of 19 out of a possible 23) at the beginning of the semester and even higher (a sample mean of 21 out of a possible 23) at the end of the semester. This trend in results is in agreement with the views of Kosbad (1989) and the findings of Knights & McDonald (1989) with respect to adult learners in higher education. The results also confirm those of James (1982) where he noted that higher anxiety, work satisfaction, and syllabus-boundness discriminated the distance learners from the campus learners. An interesting development from this study is the fact that while anxiety increased at the end of the semester, the negative feelings associated with some factors which affected learning at a distance decreased significantly ($p < .05$) towards the end of the semester. It may well be that whereas the students had become accustomed to the effects of some of the factors affecting their studies other matters probably examinations heightened anxiety at the end of the semester. Further exploration of this trend of results should prove very informative.

In the opinion of the students, the factors of Content of the study materials, Finance, Readiness to study, Time and Employment affect their learning at a distance. There were also significant differences in the views of the students before and after the semester. Although the students' negative feelings decreased significantly towards the end of the semester, in factors like Content of the study materials, Finance and Readiness, a significant increase was noticed for the factor of Time between the students pre-semester and post-semester opinions. An increase, although not significant ($p > .05$), was noticed for the factors of Employment, Family Support, and Other (health related). A possible interpretation of this trend could be that while

the students found ways to cope with the factors associated with Content, Environment, Finance and Readiness, the factors of Time, Employment, Family Support and others might have constituted more problems than they had thought or expected. It does seem from the results of this study that theses factors are pervasive in distance learning mode as they have been found with adult learners in the conventional face-to-face mode in higher education (Knights & McDonald, 1989; Simon & Thomas, 1983; Kosbad, 1989).

With regard to the moderator variables which relate to anxiety and opinions of students about learning through the distance mode, the results of this study, contrary to those of others (Simon & Thomas, 1983), indicated that gender, age, marital status and the course of study did not matter. The students were anxious irrespective or in spite of these characteristics. The situation is slightly different with regard to their opinions concerning factors which affect their learning by the distance mode. The opinions of the students bore significant relationship with their age, marital status and course of study but not with their gender thereby confirming in part the findings of Simon & Thomas (1983) and the views expressed by Knights & McDonald (1989) as earlier discussed. Therefore, in addition to age which James (1984) found to be an important variable in studies of distance learning students, marital status and course of study are also important factors which, according to the opinions of the students, affect learning at a distance.

Two significant points need to be mentioned at this juncture. First, if the results of this study are not merely artefacts of the design, the abundant presence of anxiety in, and negative opinions about factors affecting, studying at a distance by students is implicated. This study did not set out to examine cognitive outcomes and anxiety towards and opinion about learning at a distance for reasons already mentioned. However, the results of this study would seem to suggest the need to place this in a perspective for comprehensive interpretation even though in our experience distance education students are as successful as the conventional students in their academic pursuit. From our experience also, the attrition rate among distance students is by far higher than what occurs in on-campus studies. The effect of anxiety and factors which affect learning at a distance may well be playing more significant roles than are imagined. It would therefore be worthwhile to carry out more extensive study on the issue probably comparing on-campus with off-campus students with the introduction of other variables like achievement outcomes and a longer period of study eg. one full academic year rather than the one semester covered by this study.

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Table I: Descriptive data and t-test of scores in the pre-semester and post-semester administration of the Affect Adjective Checklist on Anxiety.

Administration	N	Min Score	Max Score	Mean	S.D	t-Value	Significance
Pre-semester	220	5	19	11.98	2.34	-2.52	.01*
Post-semester	220	2	21	12.41	2.60		

* p< .01

Table II: Descriptive data and t-test of scores in the pre-semester and post-semester administration of the Opinionnaire on Factors which Affect Learning at a Distance.

Administration	N	Min Score	Max Score	Mean	S.D	t-Value	Signlficance
Pre-semester	189	106	192	151.67	15.12	2.19	.03*
Post-semester	189	113	187	149.76	14.54		

* p< .05

Table III: Comparison of students pre and post semester responses to the Opinionnaire on factors affecting learning at a distance.

Sub-scales	Pre-Semester		Post-Semester		t-value	Sig
	x	SD	x	SD		
Content	21.82	2.39	21.22	2.41	3.41	0.00**
Environmental	22.39	3.25	22.25	3.22	0.73	0.46
Finance	17.83	3.91	15.81	3.95	6.32	0.00**
Readiness	20.40	2.20	20.00	2.30	2.70	0.00**
Time	17.44	2.97	17.74	3.13	-1.51	0.13*
Employment	18.47	4.17	19.13	4.42	-2.62	0.00*
Family Support	18.83	6.71	19.02	6.72	-0.66	0.50
Other	14.34	3.91	14.58	3.77	-0.90	0.36

* $p<.05$ ** $p<.01$

Table IV: ANOVA of students post semester scores in the Affect Adjective Checklist on Anxiety by the independent variables using the pre-semester scores as covariates.

Main Effect	SS	DF	F	Sig of F
Gender:	9.61	1	1.83	0.17
Age:	47.68	4	2.27	0.06
Marital status:	6.27	2	0.59	0.55
Course:	20.32	6	0.64	0.69

*p< .05

Table V: ANOVA of students' Post semester responses to the Opinionnaire by the independent variables using the Pre semester responses as covariates.

Main Effect	SS	DF	F	Sig of F
Gender:	0.88	1	0.01	0.92
Age:	1141.43	4	2.88	0.02**
Marital status:	691.47	2	3.05	0.04*
Course:	1854.96	6	3.12	0.00**

* p< .05, ** p< .01

APPENDIX A

Affect Adjective Checklist on Distance Learning

Instruction

The words below could describe how you feel about learning at a distance. Read through the list of words and underline those which describe how you generally feel about learning at a distance. You may underline as many or as few as you wish.

absorbed	afraid (+)	aimless	ambitious	annoyed
threatened	bored	calm (-)	careless	cautious
challenged	cheerful (-)	cheated	comfortable	confused
contented (-)	creative	curious	dedicated	desperate (+)
disappointed	efficient	entertained	excited	fearful (+)
fortunate	frightened (+)	happy (-)	hopeless	impatient
incapable	inspired	interested	joyful (-)	lazy
committed (-)	miserable	misplaced	nervous(+)	organised
overloaded (+)	panicky (+)	pleasant (-)	pleased	productive (-)
pushed	refreshed	regretful	rewarded	satisfied
secure (-)	serious	shaky (+)	steady (-)	tense (+)
terrified (+)	thoughtful (-)	upset (+)	weary	worried (+)

A word designated (+) is scored 1 if it is underlined and 0 if it is not underlined.
A word designated (-) is scored 1 if it is not underlined and 0 if it is underlined.
All other words are ignored in the scoring.